The mission of the Maryland Energy Administration (MEA) is to promote affordable, reliable, clean energy. MEA's programs and policies help lower energy bills, fuel the creation of green collar jobs, address environmental and climate impacts, and promote energy independence.

Maryland Energy
ADMINISTRATION
Powering Maryland's Future

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YEAR IN REVIEW 2013

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Innovating for a Cleaner, Greener Future

GAME CHANGERS ENERGY INNOVATION COMPETITIVE GRANT PROGRAM

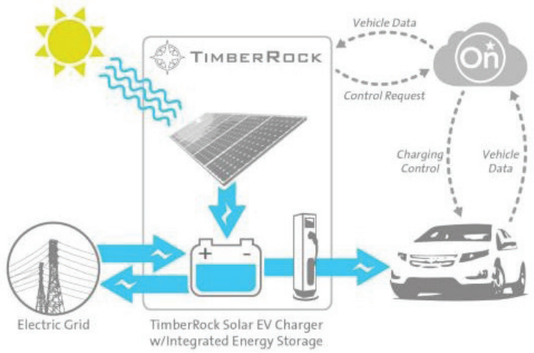
MEA helped to establish Maryland's first commercial solar microgrid at the Konterra real estate services company headquarters, which generates about 20 percent of the building's energy needs and providing 4-5 hours of important backup generation in the event of a power outage. By selling ancillary services (such as Frequency Regulation) to PJM, Konterra's solar microgrid provides a new revenue stream to help buy down the cost of the battery and make the power grid more reliable.

MEA's policy support and programs are setting the State on a path to reduce energy consumption, to increase the amount of renewable energy generated in Maryland, and to reduce harmful air pollutants. But current technologies can only get us part of the way to a cleaner, greener future. To close the gap between what we are able to do now and what we need to do to meet Governor O'Malley's goals - including a 25 percent reduction in greenhouse gases by 2020 - MEA supports innovative, market-leading technologies through the Game Changers Energy Innovation Competitive Grant Program (Game Changers).

TimberRock Energy Solutions utilized the Game Changers grants to launch the first commercially-financed, Smart Grid-compliant solar electric vehicle charging station at the General Motors headquarters in White Marsh, Maryland. In addition to charging electric vehicles, the system also ties directly to the building so that when the charging stations are not in use, the energy can be utilized throughout the building.

Also through the Game Changers program, MEA has partnered with the University of Maryland – Eastern Shore to explore cleaner, less-expensive ways to heat greenhouses. Using wood chips and poultry litter to heat a greenhouse for half the current energy cost, farmers can now grow crops all year long.

OnStar - TimberRock Solar EV Charging



Keeping the Lights on in Maryland

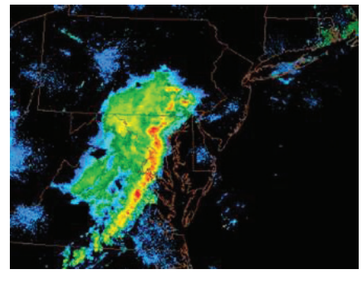
EMERGENCY PREPAREDNESS & ELECTRIC GRID RELIABILITY

Working with Maryland Emergency Management Agency and the Governor's Office of Homeland Security, MEA has begun to create a list of the "Top 100 Critical Infrastructure" in our State to serve as a starting point for energy resiliency projects.

After the Derecho and Superstorm Sandy in 2012 caused extended power outages for hundreds of thousands of Maryland residents and businesses, the Maryland Energy Administration renewed its commitment to improving Maryland's energy resilience. This commitment focused on MEA implementing the recommendations of the 2012, "Weathering the Storm: Report of the Grid Resiliency Task Force." Namely, the task force focused on advocating for policies to accelerate utility investments in the electric grid to make it more resilient to severe weather and natural disasters.

After seeing the long lines at gas stations in our neighboring states following Superstorm Sandy, MEA launched a new program to incentivize service stations to install backup power generation. Through the new $1.7 million Fuel Up Maryland Service Station Energy Resiliency Grant program, service stations in Maryland are eligible for grants to cover up to 60% of the cost of pre-wiring and backup power. The program will ensure that, in a major power outage, Marylanders are able to refuel their vehicles and get to safety. The recently expanded program expects to award approximately 70 statewide grants of a maximum value of $25,000.

Building on a University of Maryland study to analyze gaps in energy resiliency, MEA, in collaboration with the Governor's Office of Homeland Security and the Maryland Emergency Management Agency, worked to improve its ability to continue providing services during power outages.



Letter from the Director

MEA is saving Marylanders money and building a vibrant and inclusive green economy for our families.

What a year for the Maryland Energy Administration! 2013 will be remembered as the year offshore wind energy became a reality for our state's future. But that is not all that the Maryland Energy Administration (MEA) achieved this year, as it carried out its mission to bring clean, affordable, reliable energy to Marylanders. Through our various programs, MEA is saving Marylanders money and building a vibrant and inclusive green economy for our families.

This Year In Review describes many of MEA's programs and achievements in 2013. Here are some of this year's highlights:

Together with her family, husband Greg, daughter, Ellie and son, Griffin, MEA Director Abigail Ross Hopper, stands with Maryland Governor Martin O'Malley, and Lieutenant Governor Anthony G. Brown on the day of her swearing-in. Not pictured: Daughter Madeline Hopper.

Offshore Wind

Early in the year, the O'Malley-Brown Administration collaborated with legislators to create and pass The Maryland Offshore Wind Energy Act of 2013, an act that benefits all Marylanders through economic development opportunities and environmental protection. Enabled by this legislation, an offshore wind farm will create jobs in a new industry in Maryland while preventing as much as 7.5 million tons of climate change-causing pollution from entering our atmosphere. To implement the legislation, MEA immediately shifted from policy to planning mode, creating aroad map to move offshore wind energy off Maryland's coast from concept to reality.

Solar

Throughout 2013, MEA has continued to strengthen Maryland's leadership position on energy policy work in other important areas, including solar energy. At the end of 2013, there were 158 megawatts (MW) of solar energy generating capacity installed on Maryland's grid. This is up from 0.1 MW in 2006 and more than double the amount on the grid from just last year. Maryland's 200-company solar industry puts nearly 2,000 Marylanders to work in jobs that help to secure our energy future.

Resilience

In response to increasingly severe storms, MEA had a renewed focus on energy resilience in 2013. Working with sister agencies such as the Maryland Emergency Management Administration and the Governor's Office of Homeland Security, MEA examined the status of backup power generation in Maryland and provided recommendations to increase its availability, especially for vulnerable populations. We launched a new program to incentivize backup power at service stations to ensure that, during an emergency, Marylanders are able to refuel their vehicles and travel to safety.

Maryland Smart Energy Communities

This year, we launched the Maryland Smart Energy Communities program. Through Smart Energy Communities, we are encouraging local jurisdictions to set their own smart energy policies related to renewable energy, energy efficiency, and transportation. So far, nine counties and 26 municipalities have elected to be "smart energy communities."

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EmPOWER Maryland

The EmPOWER Maryland Act of 2008 established one of the most aggressive electricity reduction targets in the country. The Act aims to reduce both per capita peak demand and per capita electricity consumption in Maryland 15 percent by 2015. Commercial and industrial (C&I) customers consume over 60 percent of the electricity used in the state. In order to achieve the EmPOWER 15 percent electricity saving target, the C&I sector needs to be more engaged in implementing energy efficiency projects. This is why in 2013, MEA launched the EmPOWER Maryland Challenge. Through this Challenge, MEA will provide competitive grant awards to implement and showcase those ambitious upgrades to commercial and industrial buildings that reduce electricity usage by an estimated 20 percent or more.

Greenhouse Gas Reduction Plan

In July 2013, Governor O'Malley released Maryland's Greenhouse Gas Reduction Plan. The plan details actions and programs that will allow the State to achieve a 25 percent reduction in greenhouse gases, from a 2006 baseline, by 2020. Reductions from the energy sector account for 40 percent of the total reductions outlined in the plan. The final plan provides a clear path to the ambitious but attainable greenhouse gas reduction goal set by Maryland.

LOOKING AHEAD

While 2013 set a high bar, I am confident that together we can continue to make progress on Governor O'Malley's ambitious energy and climate goals in 2014. To accelerate progress on the goal to reduce energy consumption and peak demand, MEA will focus on the commercial and industrial sector by expanding our efforts with those customers. In 2014, MEA will also continue convening stakeholders to plan our EmPOWER energy efficiency efforts past the 2015 period established by the goal.

To continue progress toward the goal that 20 percent of the electricity generated in-State is from renewable sources by 2022, MEA will continue to focus on making offshore wind a reality. We also plan to assess opportunities to deploy more community-scale renewable energy by working with the geothermal industry and by assessing opportunities for solar on brownfields and correctional facilities.

Both our energy efficiency goals and our renewable energy goals are critical elements in our efforts to achieve our central policy focus of reducing greenhouse gas emissions by 25 percent by 2020. In addition to maximizing the benefits of energy efficiency and renewable energy, MEA, along with our fellow state agencies, will continue to expand the adoption of low and zero emission vehicles.

I am proud of the accomplishments that Maryland has made toward its energy goals over the past year and look forward to working with you to further our progress in 2014.

Sincerely,

Abigail Ross Hopper, *Director, Maryland Energy Administration*

Lowering Energy Costs for Maryland's Farmers

THE KATHLEEN A.P. MATHIAS AGRICULTURAL ENERGY EFFICIENCY PROGRAM

Fourth-generation goldfish farmer, Matt Klinger, had closed down part of his Thurmont, Maryland operations due to the high cost of heating the fish tanks. Through a Kathleen A.P. Mathias grant, he was able to retrofit his buildings, installing new lights, more efficient pumps in the filtration system, and most important, a new water heating system to heat the fish tanks. The savings allowed Matt to bring his unused production building back online and expand his business to levels he has not seen since the price of propane jumped several years ago.

Maryland's farmers are integral to the vitality of the State, providing food and maintaining land in productive use. To enable Maryland farmers to invest in their farms rather than simply pay their energy bills, MEA introduced the Kathleen A.P. Mathias Agricultural Energy Efficiency Program in 2012. In the winter and spring of 2013, 16 farms retrofitted a total of 750,000 square feet in 48 buildings, saving on average 24 percent of the energy used by those buildings. The average payback period for the energy investments is just over eight years. The program has been such a success that some neighboring farms, after seeing the payoff of energy efficiency investments, have become interested in implementing measures themselves.

The retrofits will save farmers over $230,000 annually that would have otherwise been spent on propane, natural gas, diesel fuel, and electricity. This allowed the farmers to invest more money in their core business while reducing greenhouse gas emissions. The energy saved is the equivalent of taking 200 cars off the road for an entire year.

MEA produced a series of videos to highlight the innovative energy efficiency projects, allowing other farmers to see the projects and understand the benefits. The video case studies have spurred demand for the program in the future. To view the videos, visit http://energy.maryland.gov/Business/mathiasag/index.html

Matt Klinger, fourth-generation goldfish farmer, stands with his energy saving heating system.

Cleaner Transportation Options for Families and Fleets

ALTERNATIVE TRANSPORTATION

In April 2013, the new public access on-airport compressed natural gas (CNG) fueling facility owned and operated 24/7 by Clean Energy at Baltimore/Washington International Thurgood Marshall Airport began providing cleaner, lower-cost, domestic CNG fuel for public and private vehicles and fleets, including airport shuttle buses, shared-ride vans, taxis, trucks, and personal use vehicles.

2013 was a great year for alternative fuel vehicles in Maryland. Nearly 3,000 electric vehicles are now registered in Maryland, and Governor O'Malley has committed to making Maryland a leader by signing on to an eight-state agreement to put 3.3 million "zero-emission vehicles" on the road in the nation by 2025. Leveraging dollars from the Strategic Energy Investment Fund, MEA has supported a variety of initiatives under the Clean Cities Program. From nearly 700 tax credits for electric vehicles and the associated charging equipment in 2013 alone to vouchers for fleets to upgrade to cleaner-burning fuels, we continue to accelerate the adoption of alternative transportation in Maryland.

Through the Maryland Natural Gas Voucher Program, MEA provided financial assistance for new and converted natural gas vehicles registered in Maryland. Vehicles purchased with these vouchers will save over 600,000 gallons of diesel and gasoline fuel over their lifespan.

(Above) General Motors now produces the electric motor for the Chevrolet Spark, at their White Marsh, Maryland facility. MEA Director of Energy Programs, Fred Hoover, stands beside the Spark while at a Chevrolet event celebrating the car this past spring.

(Left) Last year, the Maryland Clean Cities Program was responsible for displacing over 13 million GGE (gasoline gallon equivalent).

Maryland Energy ADMINISTRATION

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Maryland Energy ADMINISTRATION

Sustainable Energy for the Future of Maryland's Communities

MARYLAND SMART ENERGY COMMUNITIES

University Park Elementary School in the Town of University Park, Prince George's County, has already passed its policies and completed its project. The school used funding from the Smart Energy Communities program to install solar panels on its roof. The panels will provide enough energy to power the equivalent of 225 homes over its 25-year lifespan, reducing greenhouse gas emissions by 1,500 tons in that time period.

Pictured: Director Hopper with her daughter, Madeline, stands with the solar array at University Park Elementary.

New in 2013, MEA's Smart Energy Communities program inspires local communities to adopt smart energy policies. In return for passing two policies related to energy efficiency, renewable energy, or transportation, communities receive grants to complete an energy-related project. Local governments can choose from the following policies: a 15 percent reduction in their electricity use within five years, a goal of generating 20 percent of electricity from renewable sources by 2022, or a 15 percent reduction in transportation petroleum within five years. Nine counties, including Baltimore City, and 26 cities and towns received over $4 million for projects including energy efficiency upgrades to municipal buildings, power purchase agreements for renewable energy, or vehicle fleet upgrades to hybrid or electric vehicles. In future rounds, new communities can enter the program and existing communities will be able to apply for funding for projects to further progress on their goals.

- By the end of 2013, communities will have policies in place and plans to accomplish their energy goals. By June 2014, projects funded through the grant will be complete.
- Baltimore City chose to adopt all three model policies and began work on energy efficiency projects to reduce energy consumption at city libraries, police stations, recreation and community centers.
- Highland Beach in Anne Arundel County used funding from the Smart Energy Communities program to effectively make the municipal government a "net zero" government. By installing solar photovoltaic panels on the roofs of the two municipal buildings—the Town Hall and Frederick Douglass Museum—and conducting energy efficiency retrofits, the town on average generates more electricity than it needs. This small community is now building on its success by targeting residences for energy efficiency work.

Maryland's Smart Energy Communities include:

Aberdeen, Anne Arundel County, Baltimore City, Bladensburg, Boonsboro, Capitol Heights, College Park, Cottage City, Denton, Edmonston, Emmitsburg, Forest Heights, Frederick County, Garrett County, Glenarden, Greenbelt, Harford County, Highland Beach, Hyattsville, Landover Hills, Manchester, Montgomery County, Mount Rainier, Prince George's County, Princess Anne, Rock Hall, Rockville, Seat Pleasant, Takoma Park, Talbot County, Taneytown, Thurmont, University Park, Westminster

Energy Efficiency in Commercial and Government Buildings

JANE E. LAWTON CONSERVATION LOAN PROGRAM AND BETTER BUILDINGS CHALLENGE

The Baltimore Ravens, in partnership with the Maryland Stadium Authority (MSA) and energy audit support from MEA, have earned a LEED-certified "Gold" designation for M&T Bank Stadium from the U.S. Green Building Council (USGBC). The stadium becomes the first existing outdoor professional sports facility in the United States—including all NFL and Major League Baseball stadiums—to receive USGBC's Gold rating. A LEED certification is recognized across the globe as the premier mark of achievement in green building.

The Jane E. Lawton Conservation Loan program provides loans to local governments, non-profits, and businesses in Maryland to install energy saving measures. The savings from the projects in turn repay the loan. In 2013, Maryland made five loans totaling $1.5 million, saving about $306,000 annually.

Maryland has also committed to reducing electricity and gas energy usage by 20% by 2020 in 10 million square feet of existing building stock through the U.S. Department of Energy's Better Buildings Challenge (BBC). This includes 9 million square feet from State buildings and another 1 million square feet from the University of Maryland's College Park campus.

In order to reach these aggressive goals, numerous state buildings are undergoing energy efficiency upgrades, including the following:

- The headquarters of the Maryland Motor Vehicles Administration presents a unique opportunity to implement a variety of energy reduction strategies for an expected 20% annual savings.
- Knowing that the cheapest kilowatt is the one never used, the Kim Engineering Center at the University of Maryland will undergo an energy saving retrofit that will deliver combined utility and operational savings of more than 20% annually.

When Barbara Norman, General Manager of the Westminster Riding Club (WRC), realized she'd have to replace the WRC's aging HVAC system, the prohibitively high costs sent her reeling. "I knew the time was coming for a new system but replacing the coil alone was going to cost $9,000," Norman recalled. A quick Google search for "grants for energy projects" referred her to MEA's Jane E. Lawton Conservation Loan Program. As it turns out, WRC was a prime candidate for a Lawton Loan and the organization now saves almost $8,000 in annual energy costs.

EmPOWERing Maryland's Communities with Affordable, Reliable Clean Energy

MARYLAND'S EmPOWER CLEAN ENERGY COMMUNITIES

The energy efficiency retrofits for Dottie Fratturelli's home are expected to reduce her utility bills by 19 percent—that's a savings of $352 per year! The cost of all the health, safety, and energy efficiency strategies was $3,049, and the payback is 8.6 years. Ms. Fratturelli said, "I felt a difference in the house as soon as the work was completed!" She also said that she "felt very grateful for this program because I could not have afforded the retrofits otherwise."

Dottie Fratturelli, a grant recipient of the EmPOWER Clean Energy Communities Program, lives in Landover Hills, which is part of a collaborative partnership with other towns in Prince George's County. The Town of Bladensburg, the lead town for the Prince George's Municipal Weatherization Collaboration project, submitted a grant application in the fall of 2011 to participate in MEA's EmPOWERING Clean Energy Communities Program. The group began implementing the award in February 2012, and Ms. Fratturelli's home was one of the first ones to be completed. To date, more than 35 homeowners have participated in this multi-jurisdictional collaboration, with 90 homeowners expected to receive weatherization improvements by the end of June 2014.

Thanks in part to her community's grant, Ms. Fratturelli was able to upgrade the insulation in her attic, improve the air sealing around her house, install CFLs, and replace her old refrigerator with a more energy efficient model. Not only was she grateful for the energy-saving and cost-saving measures, she also appreciated something else the upgrades uncovered. During installation, significant health and safety issues were revealed and addressed. With the repair of a gas leak and the installation of carbon monoxide and smoke detectors, Fratturelli's home is not only saving her money, it's quite possibly saving her life, too.

Five Years of Saving Energy and Money

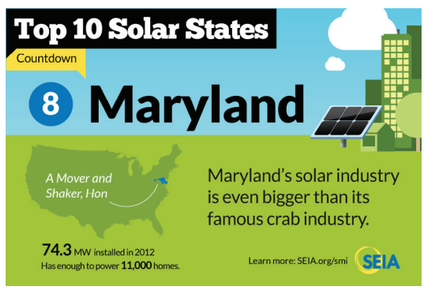
Since 2009, MEA has been easing the stress of utility bill payments while reducing Maryland's energy consumption through the EmPOWER Clean Energy Communities Program. In five years, we've helped over 5,000 low- moderate income Marylanders implement energy saving utility and appliance upgrades that have saved millions of dollars in energy costs. Our grant funding, which is funneled through community organizations such as Habitat for Humanity, Civic Works and others throughout Maryland's 23 counties as well as Baltimore City, is based on a formula that takes into account the number of low to moderate income households residing in each respective area.

Clean Energy Savings for Marylanders

CLEAN ENERGY GRANT PROGRAM

MEA has extended the Clean Burning Wood Stove program from it's initial pilot status. The Administration also announced that grant funding levels will be increased to $500 for qualified wood stoves and $700 for qualified pellet stoves. The program was designed to provide assistance to rural Marylanders who currently heat their homes with electricity or fossil fuels such as oil and propane and who do not have access to natural gas heat. Since the inception of this funding, MEA supported wood or pellet stoves in a total of 347 homes, replacing dirtier heating systems.

Each year, MEA does significantly more to increase the amount of renewable energy generated from the State's abundant resources. Supporting renewable energy systems for home and business owners reduces energy costs and our dependence on conventional fuels while supporting a green economy and creating good jobs for years to come. In 2013, MEA leveraged the Strategic Energy Investment Fund to install 1,492 solar photovoltaic systems, 500 geothermal units, 297 wood-burning stoves, and 255 solar hot water systems on Maryland homes and businesses.



The Maryland, District of Columbia & Virginia Solar Energy Industries Association recently reported that the solar industry is now even larger than Maryland's famous crab industry, putting nearly 2,000 Marylanders to work at over 200 companies.

Maryland now has over 158 megawatts of solar connected to the distribution grid, up from less than 0.1 megawatt in 2006. MEA has also partnered with the Public Service Commission to produce, *A Guidebook to Net Metering in Maryland.* This was a partnership between agencies and electric distribution companies and cooperatives to convey accurate information on net metering laws and regulations that apply to clean energy systems serving residential, commercial, and aggregate loads in Maryland.

Offshore Wind:

Maryland's Most Abundant Clean Energy Resource

THE MARYLAND OFFSHORE WIND ENERGY ACT OF 2013

The Governor and MEA had the "wind in our sails" this year with the Offshore Wind Energy Act of 2013!

With MEA's policy and technical support, the General Assembly passed the Governor's proposal to enable a wind farm off the coast of Ocean City. After the passage of the bill in March, MEA immediately turned its attention to the project itself, charting a course to get wind turbines up and spinning off of Maryland's Atlantic Ocean coast.

- The Offshore Wind Business Development Fund Advisory Committee hit the ground running immediately after the Offshore Wind Energy Act passed in the General Assembly. The committee has offered strong recommendations on how to make offshore wind, and the accompanying economic development opportunities, a reality. From supply chain mapping to limited grant opportunities for manufacturers to forming partnerships with existing international offshore wind businesses, the Committee's recommendations will help to ensure that all Maryland businesses are able to seize this opportunity.

- MEA led a delegation to Europe in order to solidify our ongoing collaboration with the Kingdom of Denmark with a formal memorandum of understanding (MOU) to partner on offshore wind technology, deployment methods and best practices and to attend the European Wind Energy Association Offshore Wind Expo in Frankfurt, Germany.

- MEA commissioned the first high-resolution geophysical survey of the Maryland Wind Energy Area to better understand the geology of the ocean floor and the types of turbine foundation best suited to the area.

- MEA partnered with the Maryland Department of Natural Resources to perform a comprehensive suite of ocean ecological surveys so that offshore wind can be developed in harmony with the natural marine environment.

- Together with the Department of Business and Economic Development and Maryland Port Administration, MEA is evaluating the offshore wind supply chain to ensure that Maryland's infrastructure is prepared for the manufacturing and staging facilities required for offshore wind, and that Maryland businesses, especially small businesses and minority-owned businesses, are able to benefit from this new economic sector.

- MEA is convening specific task forces to look at economic and educational opportunities, particularly for emerging businesses, including minority and women-owned businesses, community colleges, and historically black colleges and universities, in offshore wind.